

MONITORING THE CRAB PULSAR

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Final Report

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The monitoring of the X-ray pulses from the Crab pulsar is still ongoing at the time of this writing, and we hope to be able to continue the campaign for the life of the XTE mission.

We have established beyond all doubt that:

- the x-ray main pulse leads the radio pulse by approximately 300 microseconds
- this phase lag is constant and not influenced by glitches
- this lag does not depend on x-ray energy
- the relative phase of the two x-ray pulses does not vary
- the spectral indices of primary, secondary, and inter-pulse are distinct and constant

At this time we are investigating whether the radio timing ephemeris can be replaced by an x-ray ephemeris and whether any long-time timing ephemeris can be established. If so, it would enable use to study variations in pulse arrival times at a longer time scales. Such a study is easier in x-rays than at radio wavelengths since the dispersion measure plays no role.

These results were reported at the 2000 HEAD Meeting in Honolulu, HI. Travel was paid partly out of this grant. The remainder was applied toward the acquisition of a laptop computer that allows independent and fast analysis of all monitoring observations.